INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN
ENGINEERING, SCIENCE & MANAGEMENT

ROLE OF INSURANCE AS A RISK MANAGEMENT TOOL IN CONSTRUCTION PROJECTS

Aniket Desai[1], Bhavin Kashiyani[2]
M.E.Student, Civil Eng. Dept., SNPIT &RC, Umrakh(GTU), Bardoli, Gujarat, India[1]
Asst. Professor, Civil Eng. Dept., SNPIT &RC, Umrakh(GTU), Bardoli, Gujarat, India[2]

***Abstract:** The development of a construction project from inception to completion takes a long time and involves many phases. It brings workers with different skills and interests together and involves the use of large and diverse set of equipment. All of these complex requirements have to be handled with proper co-ordination to provide a smooth flow of activities. It is necessary to identify and analyse the risks that may appear during project risks means the control of the project itself. Insurance is, of course, only one means of managing risks associated with such projects.This paper is a review type of work which purpose is to popularizethe knowledgeabout Insurance as a risk management tool in construction industry. The study is carried out by reviewing the relevant literature on the subject of risk management and insurance, in particular looking at insurance as means of risks transfer from literature of previous researchers.This paper aims in conducting an investigation on how insurance is used as a risk transfer tool in the construction industry and examine the interaction between construction players and insurance companies with respect to risk management.*

Keywords: **Construction Industry, Insurance, policies, Risk, Risk Management.**

1. INTRODUCTION

Construction works are hazardous by nature and accidents are frequent and often severe. The annual toll of deaths, bodily injuries and property damage in construction world is very high. Not only this but construction works involve large amount of investment especially in public projects. All of this increases the risk of construction business and makes handling of financial matters more critical. Insurance and Surety are some of the methods utilized by the contractors and client as risk controlling mechanisms. There is a growing body of interests in construction insurance, supporting interactions between the construction industry and the insurance industry.

No construction project is risk free. Every construction project, large or small, involves risks with varying impact. The construction industry is subject to more risk and uncertainty than many other industries. The process of taking a project from initial investment appraisal to completion, and into use, is complex. It requires a multitude of people with different skills and interests and the co-ordination of a wide range of

disparate, yet interrelated activities. Such complexity moreover, is compounded by many external, uncontrollable factors. Risk may hinder the successful completion of a project by causing time and budget over-run, and/or quality default. Construction insurance is used as a collective term to describe various types of policies to protect construction works, erection and operation of machinery.

2. JUSTIFICATION OF THE STUDY

Construction insurance is a practice of exchanging a contingent claim for a fixed payment to protect the interests of parties involved in a construction project. Construction insurance is a major method of managing risks in the construction industry. Its primary function is to transfer certain risks from clients, contractors, subcontractors and other parties involved in the construction project to insurers to provide contingent funding in time of difficulty. Construction insurance plays an increasingly important role in guaranteeing the success of projects, with insurers.

3. RISK MANAGEMENT AND INSURANCE IN CONSTRUCTION

3.1 Risk Transfer and Insurance Mechanism: Risk management systems are designed to deal with risk. The different perspectives of risk lead to distinct definitions of risk management. Normally, risk management focuses on managing the adverse consequences of risk. As Flanagan and Norman (1993) stated: “risk management is a discipline for living with the possibility that future events may cause adverse effects.” Risk management can be described as a structured process in which decisions are made to reduce the likelihood and/or impact of risk occurrence.

The aim of risk identification is to identify all significant sources, events and causes of risk within a project. Risk assessment is used to define and assess the technical aspects of each risk. Risk analysis is the process during which the various aspects of each risk, together with the risk dependency chains, are used to determine the effects of the risks on the project and the tasks within the project. Effective risk control reduces exposure to risk and mitigates loss.

The attitudes and responses to risk are:

- **Risk retention or absorption**
- **Risk reduction or mitigation**
- **Risk transfer**
- **Risk avoidance**

As a project progresses, the nature and extent of risks may change, new risks may emerge and existing risks may change in importance or be reallocated, and any such changes may also aggravate or ease some other risks (Rahman and Kumaraswamy, 2002). Proper and exhaustive allocation of risks cannot be achieved through contract conditions alone (Rahman and Kumaraswamy, 2002).

Risk management solutions implemented can be expressed in terms of the basic strategies of risk management behavior, the dimensions of which are the level of risk management and management’s strategic consciousness (Suominen, 1995) (Figure 1). For example, a high level of risk management can be achieved through the application of an insurance-weighted transfer strategy or a deliberate control strategy. However, the application of a risk-aware strategy or a shift strategy implies greater risk taking and a lower level of risk management for companies.

Deliberate control strategy	Insurance-weighted transfer strategy
• Insurance is considered as the last resort of risk management • Emphasis on loss prevention • Wide application of risk management operations, and the linking of insurance solutions to the company's risk management policy • Versatile application of a captive Programme • Conscious utilization of risk-bearing capacity, big and small retention in use.	• Insurance as the primary tool for risk control • High insurance cover, low retention levels • Low risks at own expense • High insurance premiums • No knowledge of the opportunities offered by risk-bearing capacity
Risk-aware strategy	**Shift strategy**
• Insurance is not the primary form of risk management behavior • Searching for the limits of risk bearing capacity • No insurance available, risk entirely one's own liability • Courageous use of high retention levels, consequences known • Insurance against risk too expensive due to high premium • Retaining some classes of risks such as transportation risk, product liability, consequential loss and loss of credit	• Relying on the previous mode of operation • No knowledge of the existence of risks and their consequences • No knowledge of the options in risk management • Negative attitude toward insurances and external services • Seeing insurance as a secondary issue Giving up insurances at random • The attitude "we've made do without insurances before"

Table 1 the Basic Strategies for Risk Management Behavior

Source: Developed from Suominen (1995)

3.2 Insurable Risks

Insurable risk means a risk, which can be covered by insurance. Contractors' All Risks (CAR) insurance can cover physical damage to materials to be used for the project - whether in transit, in storage or forming part of contract works. Even if a risk is insurable, many factors related to the insurance policy need to be considered including: adequate limit; cost/premium; insurance period; negotiation and flexibility of an insurance policy; limitations and exclusions of the insurance policy; sharing risks with insurers (deductible); ability and honor of insurer to indemnify the damage to the insured (security); insurance gaps and overlaps.

However, not all risks can be transferred to insurance. Traditionally, risk assessment checklists have offered a framework for identification of insurable risks (Williams et al., 1998). Both insurance survey and risk analysis questionnaires can help identify insurable risks.

All rights reserved by www.ijaresm.net ISSN : 2394-1766

A typical construction project will consider insurance on:	Insurance covers not usually included but obtainable:
Material Damage.	Employer's Liability/Workmen's Compensation
Third Party Liability.	Motor
Materials in Transit	Professional Indemnity (for Architects, consulting engineers etc.)
Damage to Constructional Plant	Inherent Defects
Non-negligent Indemnity	Contract Performance Guarantee Bond.

Table 2 framework for identification of insurable risks

Source: Developed from Suominen (1995)

3.3 Insurance as a Risk Management Tool for ADR Implementation in Construction Disputes: Nowadays, along with the inherent intricacy and magnitude of large-scale construction projects come increasingly complex disputes. Because most projects operate on tight budgets, alternative dispute-resolution (ADR) techniques such as negotiation, mediation, and arbitration are being widely adopted in large-scale construction projects to help handle disputes in more effective and cost-saving ways. However, the risk of incurring uncertain ADR-implementation costs in the dispute-resolution process has become an important issue. The traditional self-insured approach of simply retaining all risks is no longer considered economical. One way to reduce the potential for variations in the dispute-resolution budget is to price ADR techniques as an insurance product, which allows project participants to transfer the risk of incurring unexpectedly high ADR implementation costs to the insurance company. Despite this advantage, many factors are preventing project participants from investing in ADR implementation insurance.

3.4Insurance as a Source ofFinance: The role of insurance in project finance is not limited to risk transfer as the insurance market also provides a source of finance directly and indirectly. Project debt can be sold to life insurance companies through private placements. The market for these placements tend to be concentrated within a few large companies, and from a borrowers perspective this is positive as it may reduce the cost and time required to arrange project financing. Life insurance companies are however very sensitive to the credit worthiness of project debt securities therefore bringing some exclusivity to its availability as a source of finance.

A project's attractiveness to potential lenders can also be enhanced through the use of monoline wraps. The policy guarantees the timely payment of interest and principal payments in the event the issuer of the debt securities is unable to make these payments due to financial difficulties. By wrapping in insurance products it is then possible to expand the structured finance options for a project financing. Credit insurance thereby becomes a method of ensuring that the deal gets done.

4. TYPES OF CONSTRUCTION INSURANCE

4.1 Contractor's All Risks Insurance: The Contractor's All Risks Insurance provides comprehensive insurance solution covering a wide range of risks to which a civil construction project is exposed to, starting from arrival of construction material at site till completion of project. This policy is extremely useful for contractors, consulting engineers, architects and financiers because it contribute to reducing the overall construction expenses offering them protection against unforeseen accidents leading to financial losses under a single policy.

4.2 Contractor Plant and Machinery Policy: It is an important all risks policy covering principally movable plant and machinery owned or leased by the principals or contractors and used on site for various construction work, repairs & maintenance jobs or even regular site work.

4.3 Professional Indemnity Policy: This policy is meant for professionals to cover liability falling on them as a result of errors and omissions committed by them whilst rendering professional service. The policy offers a benefit of Retroactive period on continuous renewal of policy whereby claims reported in subsequent renewal but pertaining to earlier period after first inception of the policy, also become payable. Group policies can also be issued covering members of one profession. Group discount in premium is available depending upon the number of members covered.

4.4 Public and Product Liability: It is also known as combined liability or general liability. Public liability is a legal ability to pay compensationto third parties arising in connection with the business activities of the insured. Product liability is the legal ability to paycompensation to third parties arising in connection with the insured's products.

4.5 Worker's Compensation policy: This insurance effectively covers all liabilities whether arising under statute or at common law in relation to death or injury of employees or persons demand to be employees. The workmen's compensation insurance is the primary method by which an employer can demonstrate the ability to satisfy the obligations imposed by the worker's compensation statutes. It is compensation payable under a scheme set out in the Workmen's Compensation Act of India, monitored by the Ministry of Labor.

4.6 Builder's Risk Insurance: This coverage is designed to pay for direct loss or damage to property or work compromising the project including but not limited to access and diversion facilities and all materials and supplies that have become a permanent part of the work.

4.7 Business Interruption and Expense Insurance: This coverage is designed to pay for loss of profit and continuing fixed expenses and extra expenses resulting from an insured loss.This policy triggers only in case there is a delay in start of business due to the event happening under insurable events. This insurance protects the insured against loss of income when the rent is interrupted by an insured peril, such as fire, extended coverage, etc.

4.8 Transit Insurance: This coverage would pay for direct loss or damage to property while in transit to or from the project. Transit coverage for most contractors will involve strictly land conveyance. However, for some domestic projects and almost all foreign projects transit coverage or cargo insurance by sea or air is required. Coverage of this insurance should be equal to the value of the cargo.

4.9 Floating Marine Equipment Insurance: Many projects involve the use of vessels or boats. This would require the arrangement of hull and protection and indemnity insurances. Hull insurance will pay for direct loss or damage to boats, vessels, barges, and any other type of floating equipment used in connection with the project work.

4.10 Property Insurance: Most contractors have permanent buildings including equipment therein. These buildings should be insured at least for the perils of fire, extended coverage, vandalizing, and malicious mischief. In addition to the basic perils, the insured should consider purchase of a D.I.C. or all-risk type of policy. Principally, the addition protection should include earthquake, flood, landslide, etc.

4.11 Wrap-up Insurance: Warp-up insurance refers to situations where the owner of a large construction project elects to furnish certain insurance coverage for the owner, architect-engineer, prime contractor, and all subcontractors. The prime attraction of the wrap up form of insurance coverage is the reduced cost to the owner, both in direct cost of the premiums and the saving of the contractor's and subcontractor's mark up on the cost of the premium when owner buys and pays for insurance himself.

4.12 Burglary, Robbery, and Theft Insurance: This insurance is available in a broad form that provides coverage for the destruction or disappearance of the funds by occurrences other than actual holdup. The policy may be extended to cover loss of all property and securities, except money, from the contractor's safe deposit box by burglary or robbery.

4.13 Umbrella Excess Liability Insurance: The contractor may sometimes be concerned about the adequacy of the liability insurance it carries because of the substantial hazards that its operations present and very high awards how occasionally made in bodily injury cases. A common way to eliminate this question is through the means of umbrella excess liability insurance.

4.14 Unemployment Insurance: This is hybrid coverage, involving both Federal and state laws that provides weekly benefits payment to a worker whose employment is terminated through no fault of his own. The federal government sets minimum benefit standards for the states.

4.15 Terrorism Insurance: New concept in India but gaining popularity due to high stakes for property damage.

5. BENEFITS OF INSURANCE

5.1 Business Risk: The success of any business is based on mitigation and controlling risk it encounters. For example, airlines carry an enormous amount of risk when they fly planes full of passengers each day. The plane itself is very expensive, the passengers can face injury and death in case of a crash, and the baggage could get lost or damaged in the normal course of operations. Airlines carry all these types of risks and they buy insurance policies to manage all this risk. Insurance allows businesses to take necessary risks without fear of huge financial loss.

5.2 Safety by Awareness: Insurance is not just about paying losses that occur but also preventing losses in the first place from occurring. Insurers are better educated and aware of the causes of various losses and they can offer professional assistance for avoiding the most common causes of losses.

5.3 Economic Stimulation: The premium is received regularly in installments.Large funds are collected by way of premium. It helps in collecting saving from a large number of persons. The funds can be gainfully employed in industrial development of a country.

5.4 Providing Security: Insurance helps in decreasing the likelihood of financial hardship in case of a disaster or loss. Life as well as today faces lot of uncertainties. Insurance provides a cover against any sudden loss. Insurance, therefore, protects you from financial loss and creates stability in difficult times.

5.5 Planning and Peace of Mind: Insurance encourages the behavior to plan in advance for life stage needs. With insurance, you know that you have a cushion on which you can rely, giving you peace of mind.

5.6 Investment: Insurance shows lenders that they have some guarantee of getting money back in the event of a disaster. This makes it more likely that the lender will invest because they see you as less of a liability.

5.7 Spreading Risk : The basic principal of insurance is to spread risk among a large number of peoples. A large number of persons get the insurance policies and pay premium to the insurer .whenever a loss occurs, it is compensated out of fund to the insurer. This helps in spreading risk from one individual to society at large.

5.8 Health and Wellness: Given the increasing incidence of lifestyle diseases and escalating medical costs, Insurance provides the benefits of protection against critical diseases and hospitalization expenses. From a business standpoint, providing health insurance to employees is a valuable tool to attract and retain the best employees. It also makes your company more attractive if your coverage is more comprehensive than that of your competitors.

5.9 Encourages Savings: As, some amount of premium needs to be periodically paid against an insurance policy, it leads to compulsive saving behavior. It inculcates the habit of saving among people while planning for a better future.

5.10 Tax Benefits: Pre-tax benefits are added advantages to the policyholders. These benefits help them to save a large portion of their tax payment. When the tax-payment gets reduced, their disposable income increases.

CONCLUSION

Construction insurance plays an important role in transferring risks in the construction industry. The future research can focus on the issues of motives for construction purchase, special risk considerations, changing environment, interaction to risk management, and alternative risk transfer solutions. They will contribute a better understanding for both industries, i.e. the insurance industry and especially the construction industry because the changing business environment needs the construction industry to improve its ability to manage construction risks.

Out of all the insurance policies, CAR policy has become a mandatory insurance requirement. CAR policy covers most of the risks specified in projects. Client's requirements and the Conditions of Contract are the most significant factors influencing the contractor to obtain a CAR insurance policy. Insurance companies and contractors should maintain a cordial relationship by means of active communication especially with underwriters, loss adjusters, etc. Contractors should implement maximum safety measures as a priority especially if it can be foreseen as a potential risk of damage.

ACKNOWLEDGMENT

The author thankfully acknowledge to Mr. J.N.Patel, Chairman Vidyabharti Trust, Mr. K.N.Patel, Hon. Secretary, Vidyabharti Trust, Dr. H.R.Patel, Director, Dr.J.A.Shah, Principal, Dr. Neeraj Sharma, Head of Civil Engineering Department, Asst. Prof Bhavin

Kashiyani, Our Guide,S.N.P.I.T.&R.C.,Umrakh, Bardoli, Gujarat, India for their motivational & infrastructural supports to carry out this research.

REFERENCES

[01] Ms. Ashley Babu, Dr. S. Kanchana, “Role of insurance in construction and infrastructure projects”, International Journal of Civil Engineering and Technology, Volume 5, Issue 12, December (2014), pp. 206-210

[02] B.A.K.S. Perera, R.M.C.K. Rathnayake, R Rameezdeen, “Use of insurance in managing construction risks: Evaluation of Contractors’ All Risks(CAR) insurance policy”, Built-Environment - Sri Lanka - Vol. 08, Issue 02 : 2008

[03] John Baartz, Partner Nick Longley, Special Counsel Allens Arthur Robinson, “Construction and Infrastructure Projects – Risk Management through Insurance”, © Copyright Allens Arthur Robinson 2003

[04] Xinyi Song, “ The Application Of Insurance As A Risk Management Tool For Alternative Dispute Resolution (ADR) Implementation In Construction Disputes”, Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Graduate School of Arts and Sciences COLUMBIA UNIVERSITY 2013

[05] PiotrTworek , MarcinTomecki , “Risk and insurance in construction: insurance contracts used in investment process in Poland – legal and economic aspects, survey research”, 6th International Scientific Conference Managing and Modelling of Financial Risks 2012

[06] Williams, C. A., Smith, M. L. and Peter, C. Y. (1998) Risk management and insurance, Irwin/McGraw-Hill, Boston, Mass.

[07] “Prelaunch Survey Report of Insurance Awareness Campaign”, Insurance Regulatory and Development Authority, National Council of Applied Economic Research, 2011

[08] Kartam, N.A. &Kartam, S.A. (2001) Risk and its Management in the Kuwaiti Construction Industry: a Contractor’s Perspective, International Journal of Project Manage ment, vol. 19, no, pp. 325-335.

[09] Odeyinka, H.A. (2000) An evaluation of the use of insurance in managing construction risk, Construction Management and Economics, vol. 18, no. 5, pp. 519-524.

[10] Rahman, M. M. and Kumaraswamy, M. M. (2002) Risk management trends in the construction industry: moving towards joint risk management. Engineering, Construction and Architectural Management, 9(2), 131-151.

[11] Suominen, A. (1995) Risk management behaviour and company policy for insurance-apart of business decision-making. The Geneva Papers On Risk and Insurance, 20(76), 306-314.

[12] Williams, C. A., Smith, M. L. and Peter, C. Y. (1998) Risk management and insurance,Irwin/McGraw-Hill, Boston, Mass.